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EXAMINER	
CASTRO, ANGEL A	

ART UNIT	PAPER NUMBER
2653	11

DATE MAILED: 12/18/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/676,216	Applicant(s) PAN ET AL.	
	Examiner Angel A Castro	Art Unit 2653	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12 September 2003*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-29* is/are pending in the application.

4a) Of the above claim(s) *25 and 26* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-24, 27-29* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

13)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

a) ☐ The translation of the foreign language provisional application has been received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

This Office Action is in response to Amendment A filed on 9/12/03.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1, 7, 14-16, 24 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Patterson et al (U.S. Pat. 6,424,498) in view of Bennin et al (U.S. Pat. 5,982,584).

Regarding claim 1, Patterson et al discloses an integrated lead suspension assembly for supporting a slider in a magnetic storage system (figures 1, 3 and 7), comprising:

a load beam 200, the load beam having a longitudinal, generally flat structure;

a limiter 204 having a free end extending from a fixed end from the load beam, the limiter is bendable from a first position in which the free end is substantially in a plane of the load beam, to a second position in which the free end is substantially out of the plane of the load beam; and

a flexure assembly 206 comprising a longitudinal, generally flat flexible member, a first section of the flexible member being fixedly attached to the load beam, and a second section of the flexible member defining a slider mounting section 208 for supporting a slider 210 and an aperture (shown in figure 3, but not labeled) that is sized and positioned with respect to the limiter such that the limiter is free to be bent from the first position to the second position and extend through the aperture after the flexure assembly has been attached to the load beam, wherein

the slider mounting section extends into the aperture, having an end that interacts with the limiter in its second position.

Regarding claim 7, Patterson shows that the flexible member is substantially free of permanent bending in its substantially flat structure (see figure 3).

Regarding claims 14 and 29, Patterson further discloses that the load beam has a tip region at a distal end of the load beam (figure 7), and comprises a tab 602 extending from the distal end of the load beam, wherein the tab has a curve surface (shown in figure 7 but not labeled) for interacting with an external cam surface 604 for slider loading and unloading with respect to a parked position.

Regarding claim 15, Patterson shows that the second section of the flexible member extends over a tip region of the load beam, wherein the tip region is substantially same or narrower than the slider mounting section (see figure 3).

Regarding claim 16, Patterson shows that the load beam has low profile flanges along the longitude, generally flat structure that add structural rigidity to the load beam (see figure 3).

Regarding claim 24, Patterson further discloses a magnetic storage system with a magnetic storage medium 108 (figure 1) with a data surface of concentric data tracks;

a motor drive 106 for rotating the magnetic storage medium;

an actuator assembly 110 coupled to the slider for pivotally positioning the slider relative to the magnetic storage medium to selected tracks on the data surface.

a control unit (it is inherent that the magnetic storage system has one) for controlling the operations of the motor drive and actuator assembly and processing data read from and written to the data surface.

Bennin shows an integrated lead suspension (figures 3-7) where conductive leads 46 are formed on a flexible member 24.

Although most suspensions have conductive leads, Patterson does not specifically show the conductive leads formed on the flexure. Assuming *arguendo* that Patterson did not show the conductive leads formed on the flexure, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the suspension assembly of Patterson with the conductive leads formed on the flexure in view of the teachings of Bennin.

The rationale is as follows: One of ordinary skill in the art would have been motivated to provide the suspension assembly of Patterson with the conductive leads formed on the flexure as taught by Bennin as it would spare the need to string separate wires, thus providing a lighter and thinner suspension.

3. Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Larson et al (U.S. Pat. 6,151,197) in view of Bennin et al.

Regarding claim 1, Larson et al discloses an integrated lead suspension assembly for supporting a slider in a magnetic storage system (figures 3-4 and 6), comprising:

a load beam 301, the load beam having a longitudinal, generally flat structure;

a limiter 360 having a free end extending from a fixed end from the load beam, the limiter is bendable from a first position in which the free end is substantially in a plane of the load beam, to a second position in which the free end is substantially out of the plane of the load beam; and

a flexure assembly 354 comprising a longitudinal, generally flat flexible member, a first section of the flexible member being fixedly attached to the load beam, and a second section of the flexible member defining a slider mounting section (figure 4) for supporting a slider 400 and an aperture (shown in figure 6, but not labeled) that is sized and positioned with respect to the limiter such that the limiter is free to be bent from the first position to the second position and extend through the aperture after the flexure assembly has been attached to the load beam, wherein

the slider mounting section extends into the aperture, having an end that interacts with the limiter in its second position.

With regard to claim 1, Bennin shows an integrated lead suspension (figures 3-7) where conductive leads 46 are formed on a flexible member 24.

Although most suspensions have conductive leads, Larson et al does not specifically show the conductive leads formed on the flexible member. Assuming *arguendo* that Larson did not show the conductive leads formed on the flexure, it would have been obvious to one of

ordinary skill in the art at the time the invention was made to provide the suspension assembly of Larson with the conductive leads formed on the flexure in view of the teachings of Bennin.

The rationale is as follows: One of ordinary skill in the art would have been motivated to provide the suspension assembly of Larson et al with the conductive leads formed on the flexure as taught by Bennin as it would spare the need to string separate wires, thus providing a lighter and thinner suspension.

4. Claims 2-6, 8 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Larson et al in view of Bennin et al as applied to claim 1 above, and further in view of Takagi et al (U.S. Pat. 6,388,843).

Regarding claims 2-6, 8 and 27, Larson et al in view of Bennin et al discloses the integrated lead suspension described above.

Regarding claims 2 and 27, Larson shows the free end of the limiter extends towards the second section of the flexible member.

Regarding claim 3, Larson shows that the aperture is located in the second section of the flexible member between the first section and the slider mounting section (see figure 6).

Regarding claim 4, Larson shows that the aperture is located in the second section of the flexible member at a leading edge side of a slider to be placed into operation (see figures 3B and 6).

Regarding claims 5-6, Larson discloses that the flexible member defines a stop 358 that interacts with the limiter 360 in its second position such that movement of the flexible member away from the load beam is limited by catching the limiter by the stop (column 7, lines 16-24).

Regarding claim 8, Larson shows a pivoting means 356 for pivoting gimbal motion of the slider mounting section, wherein the aperture in the flexible member is between the pivoting means and the first section of the flexible member (see figures 3-4 and 6).

Regarding claims 2-6, 8 and 27, Larson et al in view of Bennin does not show the free end of the limiter extending toward the first section of the flexible member and that the stop comprises a hook member.

Regarding claims 2-6, 8 and 27, Takagi et al shows a suspension for a disc drive (figures 1-3, 10) where the free end 54 of the limiter 50 (or 74 in figure 10) extends towards the first section of the flexible member 22 (the part attached to the load beam 21) where the stop comprises a hook member 21b (figure 10).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the lead suspension assembly of Larson in view of Bennin with the limiter in the opposite direction (with the free end of the limiter extending toward the first section of the flexible member) and the stop in the form of a hook as taught by Takagi, and since it has been held that a mere reversal of the essential working parts of a device involves only routine skill in the art. *In re Einstein*, 8 USPQ 167 (CCPA 1931).

The rationale is as follows: One of ordinary skill in the art would have been motivated to the lead suspension assembly of Larson in the opposite direction (with the free end of the limiter extending toward the first section of the flexible member) as taught by Takagi as it would produce an even higher vertical stiffness in a short vertical lift (column 7, lines 21-29).

5. Claims 9-13, 21-23 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Larson et al in view of Bennin et al as applied to claim 1 above, and further in view of Simmons et al (U.S. Pat. 5,986,853).

Regarding claims 9-13 and 28, Larson et al in view of Bennin et al discloses the integrated lead suspension described above. Larson in view of Bennin does not show that:

the terminal pads of the conductive leads are not supported by the flexible member (claim 9),

the terminal pads of the conductive leads are located over the openings of the flexible member (claim 10),

the insulation layer extends below the terminal pads but cover an area smaller than the terminal pads and does not extend to the edges of the terminal pads (claims 11-12),

Regarding claims 13 and 28, as the claims are directed to an integrated lead suspension, per se, the method limitations appearing in line 2 of claim 13 and line 10 of claim 28 have only been accorded weight to the extent that they affects the structure of the completed integrated lead suspension. Note that "determination of patentability in 'product-by-process' claims is based on product itself, even though such claims are limited and defined by process [i.e., "solder ball bonding"], and thus product in such claim is unpatentable if it is the same as, or obvious form, product of prior art, even if prior product was made by a different process", *In re Thorpe*, et al., 227 USPQ 964 (CAFC 1985). Furthermore, note that a "product-by-process claim, although reciting subject matter of claim in terms of how it is made [i.e., "solder ball bonding"] is still product claim; it is patentability of product claimed and not recited process

steps that must be established, in spite of fact that claim may recite only process limitations", *In re Hirao and Sato*, 190 USPQ 685 (CCPA 1976).

Regarding claims 9-13 and 28, Simmons et al shows an integrated lead suspension comprising stacked conductive leads (figures 3-4, 7 and 11-16) that separate at the head termination pads, where the terminal pads of the conductive leads 302, 304, 306, 308, are not supported by the flexible member 220, 222 (figure 4e) and located over the openings 234 in order to bend as they approach the head termination pads (figures 4e and 7), the insulation layer 156 extends below the terminal pads but cover an area smaller than the terminal pads and does not extend to the edges of the terminal pads (figures 4c and 4d).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the integrated lead suspension of Larson et al in view of Bennin with the terminal pads of the conductive leads not supported by the flexible member and located over the openings and the insulation layer covering an area smaller than the terminal pads as taught by Simmons et al.

The rationale is as follows: Simmons et al use of stacked conductive leads produce noise cancellation and a reduction in size of the suspension. One of ordinary skill in the art would have been motivated to provide the integrated lead suspension of Larson et al in view of Bennin with the integrated lead suspension and stacked conductive leads of Simmons as it would allow a reduction in size of the suspension thus of the disk drive.

Regarding claims 21-23, Larson in view of Bennin discloses a load beam with a hinge region (Larson in figure 3A and Bennin in figure 3), conductive leads 46 for reading and writing to and from the slider, and the first section of the flexible member has a split section 32

(see Bennin, figure 3) above the hinge region, wherein the overall perimeter of the split section is generally symmetrical with respect to a longitudinal axis (see Bennin, figure 3). Larson in view of Bennin does not specifically disclose that the flexible member has a split section above the hinge region, supporting read leads on a first branch and write leads on a second branch, wherein the read leads are wider than the write leads and the first branch is wider than the second branch.

Simmons et al discloses that the conductive leads 120 (figures 4c and 11-16) that includes read leads for read data and write leads for write data to and from the slider, and the first section of the flexible member has a split section 202 above the hinge region, supporting read leads on a first branch and write leads on a second branch of a different width (see figure 12, column 6, lines 27-31).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the integrated lead suspension of Larson in view of Bennin with the first section of the flexible member having a split section above the hinge region, supporting read leads on a first branch and write leads on a second branch of a different width as taught by Simmons.

The rationale is as follows: It is well known in the art that it is desirable to widen the conductors for high frequency signals and to separate the conductive leads to avoid the cross coupling between them. One of ordinary skill in the art would have been motivated to provide the integrated lead suspension of Larson in view of Bennin with the first section of the flexible member having a split section above the hinge region, supporting read leads on a first branch and write leads on a second branch of a different width as taught by Simmons, as it would

reduce the cross coupling between the read and write conductive leads while allowing high frequency signals.

6. Claims 16-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Larson et al in view of Bennin et al as applied to claim 1, and further in view of Supramaniam et al (U.S. Pat. 6,014,290).

Regarding claims 16-18, Larson et al in view of Bennin discloses the integrated lead suspension described above, including a low profile flanges 352 (see Larson, figures 3B and 5).

Larson in view of Bennin does not specifically disclose the claimed angle ranges of the flanges.

Supramaniam et al discloses an integrated lead suspension (figures 1-8), including flanges with an angle within the claimed range (figures 7-8). It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the integrated lead suspension of Larson in view of Bennin with the claimed angles as taught by Supramaniam et al. Assuming *arguendo* that Supramaniam et al did not show the claimed angle range, it would have been obvious to a person having ordinary skill in the art modify the angle of the flanges during the course of routine optimization/experimentation.

The rationale is as follows: One of ordinary skill in the art would have been motivated to provide the integrated lead suspension of Larson et al in view of Bennin with the claimed angle range since such ranges, absent any criticality (i.e., unobvious and/or unexpected result(s)), are generally achievable through routine optimization/experimentation, and since discovering the optimum or workable ranges, where the general conditions of a claim are

disclosed in the prior art, involves only routine skill in the art, *In re Aller,* 105 USPQ 233 (CCPA 1955). Moreover, in the absence of any criticality (i.e., unobvious and/or unexpected result(s)), the parameters set forth above would have been obvious to a person having ordinary skill in the art at the time the invention was made, *In re Woodruff,* 919 F.2d 1575, 1578, 16 USPQ2d 1934, 1936 (Fed. Cir. 1990).

Regarding claims 19-20, Larson et al in view of Bennin et al discloses an integrated lead suspension assembly described above. Larson et al in view of Bennin does not specifically disclose at least a dimple protrusion near an edge of the load beam, on a same side as the flexure assembly and at a location where the load beam is not attached to or facing the flexible member. Supramaniam et al discloses an integrated lead suspension assembly (figures 5-6 and 12) comprising at least dimple protrusion 34, 36 (it is noted that the dimple shown in figures 1-2, can be used here as pointed out in column 6, lines 50-55), near an edge of the load beam, on a same side as the flexure assembly 91 and at a location where the load beam is not attached to or facing the flexible member. It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the integrated lead suspension assembly of Larson in view of Bennin with the dimple protrusions on the load beam as taught by Supramaniam et al.

The rationale is as follows: Supramaniam et al provide dimples to protect the conductors on the flexure from contact with the lifting arm of a shipping comb. One of ordinary skill in the art would have been motivated to provide the load beam of an integrated lead suspension assembly with the dimples on the load beam in order to protect the integrated lead suspension assembly from being damaged during shipping from one location to another.

Response to Arguments

7. Applicant's arguments filed 9/12/03 have been fully considered but they are not persuasive.

Applicant asserts in page 13, lines 6-15:

> "Further with respect to claims 1 and 24 pending in the present application, Patterson is not directed to a suspension in which the flexible member and the load beam of the suspension assembly are configured with a limiter that is formed after the flexible member has been attached to the load beam. On the contrary, referring to Figs. 3 and 4 in Patterson, the sizes and relative positions of the mounting plates (208, 208) of the gimbals (206, 306), the catch holes (212, 312), and the cutouts (202, 302) for the hooks (204, 304), are such that there is no clearance between any aperture on the gimbals (206, 306) with respect to the hooks (204, 304) on the load beams (200, 300), "such that the limiter is free to be bent from the first position to the second position and to extend through the aperture after the flexure assembly has been attached to the load beam", as required by independent claims 1 and 24."

The examiner respectfully points out that Applicant arguments refers to a process steps that is not the object of the claimed structure. Furthermore, the process claims has been restricted and withdrawn from consideration as having different classification as pointed out in the first Office Action.

Conclusion

8. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO

MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Angel A Castro whose telephone number is 703-308-8435. The examiner can normally be reached on Monday through Thursday, 8 AM to 6 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, William R Korzuch can be reached on 703-305-6137. The fax phone number for the organization where this application or proceeding is assigned is 703-746-6037.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-4750.

Angel Castro, Ph.D.

William Korzuch

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